

CLAIMS:

1. A method for displaying representations of nodes, and links connecting said nodes, said method comprising:

displaying a node line representing each one of said
5 nodes, each node line being parallel to every other node line;
and

displaying a link line representing each one of said
links, each link line being perpendicular to each node line,

wherein each link line terminates at two node lines,
10 said two node lines representing the nodes connected by the
link represented by the link line.

2. The method of claim 1 wherein each link line is
displayed in a manner which visually communicates a link
attribute of the link it represents.

15 3. The method of claim 2 wherein the link attribute is
communicated by displaying the link line in a distinctive
colour.

4. The method of claim 2 wherein the link attribute of
the link is communicated by displaying the link line as a
20 patterned line.

5. The method of claim 1 wherein each link line is
displayed in a manner which visually communicates a plurality
of link attributes of the link it represents.

6. The method of claim 1 wherein the method is practised
25 in a computer system, the method further comprising:

displaying a plurality of link attribute identifiers
for each of which there is an associated link attribute for
each link;

providing a selection input mechanism for selection of a selected one of said link attribute identifiers;

wherein upon selection of said selected one of said link attribute identifiers, each link line is displayed in a position relative to every other link line, determined by a comparison of the link attribute associated with the said selected one of said link attribute identifiers, for the link represented by the link line, with the link attribute associated with the said selected one of said link attribute identifiers, for every other link.

7. The method of claim 1 wherein the method is practised in a computer system, and wherein the nodes and links are in a telecommunication system.

8. The method of claim 7 wherein each link line is displayed in a manner which visually communicates a link attribute of the link it represents.

9. The method of claim 8 wherein the link attribute is a relative traffic level on the link.

10. The method of claim 9 wherein the relative traffic level on the link is communicated by displaying a link line whose thickness is a function of the relative traffic level on the link.

11. The method of claim 8 wherein the link attribute is a direction of travel of data on the link.

12. The method of claim 11 wherein the direction of travel of data on the link is communicated by displaying an arrowhead at one end of the link line.

13. The method of claim 8 wherein the link attribute is a geographic location of said link.

14. The method of claim 8 wherein the link attribute is a performance characteristic of said link.

15. The method of claim 8 wherein the link attribute is a status of said link.

16. The method of claim 8 wherein the link attribute of the link is visually communicated by displaying the link line in a distinctive colour.

17. The method of claim 8 wherein the link attribute of the link is visually communicated by displaying the link line as a patterned line.

18. The method of claim 7 wherein each link line is displayed in a manner which visually communicates a plurality of link attributes of the link it represents.

19. The method of claim 7 further comprising:

displaying a plurality of link attribute identifiers for each of which there is an associated link attribute for each link;

providing a selection input mechanism for selection of a selected one of said link attribute identifiers;

wherein a first link attribute is the link attribute associated with the said selected one of said link attribute identifiers, and upon selection of said selected one of said link attribute identifiers, each link line is displayed in a position relative to every other link line, determined by a comparison of the first link attribute of the link represented by the link line, with the first link attribute of every other link.

20. The method of claim 19 wherein said plurality of link attribute identifiers is displayed in a pull-down menu.

21. The method of claim 19 wherein one of said plurality of link attribute identifiers is start node, and upon selection
5 of the start node link attribute identifier and upon selection of a selected node line, those link lines representing links which start at the node represented by the selected node line, are displayed in priority to one another.

22. The method of claim 19 wherein one of said plurality
10 of link attribute identifiers is end node, and upon selection of the end node link attribute identifier and upon selection of a selected node line, those link lines representing links which end at the node represented by the selected node line, are displayed in proximity to one another.

23. The method of claim 19 wherein one of said plurality
15 of link attribute identifiers is performance characteristic, and upon selection of the performance characteristic link attribute identifier, each link line is displayed in order according to a value of a performance characteristic of the
20 link represented by the link line.

24. The method of claim 19 wherein link lines representing links having similar first link attributes are displayed in proximity to each other, to form a link grouping.

25. The method of claim 24 wherein each link grouping is
25 visually identified.

26. The method of claim 25 wherein each link grouping is visually identified by displaying a rectangle surrounding each link grouping.

27. The method of claim 25 wherein each link grouping is
30 displayed spatially separated from an adjacent link grouping.

28. The method of claim 24 wherein each link line within each link grouping is displayed in a position relative to every other link line in the link grouping, determined by a comparison of the first link attribute of the link represented by the link line, with the first link attribute of the link represented by every other link line in the link grouping.

29. The method of claim 24 further comprising:

displaying an option to compress a link grouping; and

upon selection of a link grouping, and selection of the option to compress a link grouping, erasing the link grouping and displaying a single compressed link line representing all of the links represented by the link lines comprising the link grouping, said compressed link line being perpendicular to the node lines, and terminating at the two node lines representing the two nodes connected by the links represented by the link lines comprising the link grouping.

30. The method of claim 29 wherein the step of displaying an option to compress a link grouping is performed by, upon selection of a link grouping, displaying a pop-up menu displaying an option to compress the link grouping.

31. The method of claim 29 wherein said compressed link line is visually distinguished from each of the other link lines.

32. The method of claim 29 further comprising:

displaying an option to expand a compressed link line; and

upon selection of a compressed link line, and selection of the option to expand a compressed link line, erasing the compressed link line and displaying a link grouping comprised of link lines representing links represented by the

compressed link line.

33. The method of claim 32 wherein the step of displaying an option to expand a compressed link line is performed by, upon selection of a compressed link line, displaying a pop-up menu displaying an option to expand the link grouping.

34. The method of claim 24 wherein each link line within a link grouping is displayed in a position relative to every other link line in the link grouping, determined by a comparison of a second link attribute of the link represented by the link line, with the second link attribute of the link represented by every other link line in the link grouping.

35. The method of claim 8 further comprising:

displaying a plurality of link attribute identifiers for each of which there is an associated link attribute for each link;

providing a selection input mechanism for selection of a selected one of said link attribute identifiers;

wherein a first link attribute is the link attribute associated with the said selected one of said link attribute identifiers, and upon selection of said selected one of said link attribute identifiers, each link line is displayed in a position relative to every other link line, determined by a comparison of the first link attribute of the link represented by the link line, with the first link attribute of every other link.

36. The method of claim 7 further comprising:

providing a selection input mechanism for selection of a selected plurality of said link lines;

displaying said selected plurality of said link lines in proximity to each other to form a link grouping.

37. The method of claim 36 further comprising:

displaying an option to compress a link grouping; and

5 upon selection of a link grouping, and selection of the option to compress a link grouping, erasing the link grouping and displaying a single compressed link line representing all of the links represented by the link lines comprising the link grouping, said compressed link line being
10 perpendicular to the node lines, and terminating at the two node lines representing the two nodes connected by the links represented by the link lines comprising the link grouping.

38. The method of claim 37 further comprising:

displaying an option to expand a compressed link line; and

15 upon selection of a compressed link line, and selection of the option to expand a compressed link line, erasing the compressed link line and displaying a link grouping comprised of link lines representing links represented by the compressed link line.

20 39. The method of claim 7 further comprising:

displaying a plurality of node attribute identifiers for each of which there is an associated node attribute for each node;

25 providing a selection input mechanism for selection of a selected one of said node attribute identifiers;

wherein a first node attribute is the node attribute associated with the said selected one of said node attribute identifiers, and upon selection of said selected one of said

node attribute identifiers, each node line is displayed in a position relative to every other node line, determined by a comparison of the first node attribute of the node represented by the node line, with the first node attribute of every other
5 node.

40. The method of claim 39 further comprising displaying in association with each node line, a node indicia identifying the node represented by the node line.

41. The method of claim 39 wherein said plurality of node
10 attribute identifiers is displayed in a pull-down menu.

42. The method of claim 40 wherein node lines representing nodes having a similar first node attribute are displayed in proximity to each other, to form a node grouping.

43. The method of claim 42 wherein each node grouping is
15 visually identified.

44. The method of claim 43 wherein each node grouping is visually identified by displaying a rectangle surrounding the node indicia associated with the node lines of each node grouping.

20 45. The method of claim 43 wherein each node grouping is displayed spatially separated from an adjacent node grouping.

46. The method of claim 43 wherein each node line within each node grouping is displayed in a position relative to every other node line in the node grouping, determined by a
25 comparison of the first node attribute of the node line with the first node attribute of the nodes represented by the other node lines in the node grouping.

47. The method of claim 42 further comprising:

displaying an option to compress a node grouping; and

upon selection of a node grouping, and selection of the option to compress a node grouping, erasing the node grouping and displaying a single compressed node line representing all of the nodes represented by the node lines
5 comprising the node grouping.

48. The method of claim 47 wherein the step of displaying an option to compress a node grouping is performed by, upon selection of a node grouping, displaying a pop-up menu displaying an option to compress the node grouping.

10 49. The method of claim 47 wherein said compressed node line is visually distinguished from each of the other node lines.

50. The method of claim 47 further comprising:

15 displaying an option to expand a compressed node line; and

upon selection of a compressed node line, and selection of the option to expand a compressed node line, erasing the compressed node line and displaying a node grouping comprised of node lines representing nodes represented by the
20 compressed node line.

51. The method of claim 50 wherein the step of displaying an option to expand a compressed node line is performed by, upon selection of a compressed node line, displaying a pop-up menu displaying an option to expand the node grouping.

25 52. The method of claim 42 wherein each node line within a node grouping is displayed in a position relative to every other node line in the node grouping, determined by a comparison of a second node attribute of the node represented by the node line, with the second node attribute of the node
30 represented by every other node line in the node grouping.

53. The method of claim 8 further comprising:

displaying a plurality of node attribute identifiers
for each of which there is an associated node attribute for
5 each node;

providing a selection input mechanism for selection
of a selected one of said node attribute identifiers;

wherein a first node attribute is the node attribute
associated with the said selected one of said node attribute
10 identifiers, and upon selection of said selected one of said
node attribute identifiers, each node line is displayed in a
position relative to every other node line, determined by a
comparison of the first node attribute of the node represented
by the node line, with the first node attribute of every other
15 node.

54. The method of claim 7 further comprising:

providing a selection input mechanism for selection
of a selected plurality of said node lines;

displaying said selected plurality of said node lines
20 in proximity to each other to form a node grouping.

55. The method of claim 54 further comprising:

displaying an option to compress a node grouping; and

upon selection of a node grouping, and selection of
the option to compress a node grouping, erasing the node
25 grouping and displaying a single compressed node line
representing all of the nodes represented by the node lines
comprising the node grouping.

56. The method of claim 55 further comprising:

displaying an option to expand a compressed node line; and

upon selection of a compressed node line, and

5 selection of the option to expand a compressed node line, erasing the compressed node line and displaying a node grouping comprised of node lines representing nodes represented by the compressed node line.

57. The method of claim 7 further comprising:

10 displaying, in association with each link line, a bar whose length is a function of a value of a characteristic of the link represented by the link line.

58. The method of claim 57 further comprising:

15 displaying a plurality of performance characteristics identifiers for each of which there is an associated performance characteristic value for each link;

providing a selection input mechanism for selection of a selected one of said performance characteristic identifiers;

20 wherein upon selection of said selected one of said performance characteristic identifiers, each bar is displayed having a length which is a function of the performance characteristic value associated with the said selected one of said performance characteristic identifiers, for the link
25 represented by the link line with which the performance bar is associated.

59. The method of claim 52 wherein said plurality of performance characteristic identifiers is displayed in a pull-down menu.

60. The method of claim 7 further comprising:

providing a selection input mechanism for selection of a selected plurality of said link lines;

displaying said selected plurality of said link lines
5 in proximity to each other to form a link grouping.

61. The method of claim 19 further comprising:

displaying, in association with each link line, a bar whose length is a function of a value of a characteristic of the link represented by the link line.

10 62. The method of claim 53 further comprising:

displaying, in association with each link line, a bar whose length is a function of a value of a characteristic of the link represented by the link line.

63. The method of claim 8 further comprising:

15 displaying a time selector, wherein upon selection of a time on said time selector, each link line is displayed in a manner which visually communicates a link attribute of the link it represents, as of the selected time.

20 64. The method of claim 63 wherein said time selector is a slide tab on a time bar, wherein the time is selected by moving the slide tab to a location on the time bar corresponding with the time to be selected.

65. The method of claim 19 further comprising:

25 displaying a time selector, wherein upon selection of a time on said time selector, each link line is displayed in a position relative to every other link line, determined by a comparison of the link attribute associated with the said selected one of said link attribute identifiers, for the link

represented by the link line, with the link attribute associated with the said selected one of said link attribute identifiers, for every other link, as of the selected time.

66. The method of claim 65 wherein said time selector is
5 a slide tab on a time bar, wherein the time is selected by moving the slide tab to a location on the time bar corresponding with the time to be selected.

67. The method of claim 57 further comprising:

10 displaying a time selector, wherein upon selection of a time on said time selector, each bar is displayed having a length which is a function of a value of a characteristic of the link represented by the link line associated with it, as of the selected time.

15 68. The method of claim 67 wherein said time selector is a slide tab on a time bar, wherein the time is selected by moving the slide tab to a location on the time bar corresponding with the time to be selected.

69. A computer system adapted to implement the method of claim 1.

20 70. A graphical user interface adapted to implement the method of claim 1.

71. A computer readable medium having stored thereon, instructions for instructing a computer to implement the method of claim 1.

25 72. A computer system adapted to implement the method of claim 7.

73. A graphical user interface adapted to implement the method of claim 7.

74. A computer readable medium having stored thereon,

instructions for instructing a computer to implement the method of claim 7.

75. A printed medium having printed thereon a visual representation of nodes, and links connecting said nodes, said
5 visual representation comprising:

a node line representing each one of said nodes, each node line being parallel to every other node line; and

a link line representing each one of said links, each link line being perpendicular to each node line,

10 wherein each link line terminates at two node lines, said two node lines representing the nodes connected by the link represented by the link line.